NEW YORK STATE BERRY INDUSTRY ANALYSIS

A Project Paper

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By

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ABSTRACT

While New York State (NYS) has a huge demand for berries, the local berry industry has not taken full advantage of this demand. NYS berry growers are missing business opportunities due to lack of sector growth. In response, this study analyzed the various perspectives of the current berry production and market situation, especially focusing on strawberry, blueberry, and raspberry crops.

In this study, we sought to understand the production and marketing economics that drive the NYS berry market and to provide growers with actionable insights and tools to aid them in making decisions. The research has taken place in three stages. First, the cost of berry production study was examined to establish a statewide reference, and an interactive tool based on the study was launched. The generated insights would then aid them in identifying their profitability for each berry crop and allowing them to compare these to a representative NYS farm. Second, the marketing channel surveys were distributed to gather individual farm's data on merchandising and sales channels. Collected responses from the survey provided us a better understanding of the market situation. Lastly, based on all compiled data and gathered information from both growers and the market, we generated a SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis to carefully examine the current state of the NYS berry industry, which shed light

into future business opportunities for berry growers. Suggestions and insights were provided to identify market opportunities and guide further development efforts.

The key suggestions from this study pointed out the NYS technological capacity, the diverse market access opportunity, the possibilities for local branding development, and the organizational power for outreaching and marketing.

BIOGRAPHICAL SKETCH

Shuang Qiu is a current master student studying Applied Economics and Management at Cornell University. She holds bachelor degrees of Plant Science from both the University of Maryland, College Park and the China Agriculture University, Beijing. Before starting her graduate studies, she worked in the produce industry and discovered a great interest in the food and agriculture system. She also found her love in the subject of economics, which led her to dive into agribusiness and food industry applications. As she continued her education at Cornell, Shuang challenged herself to pick up difficult subjects and courses, fearlessly expanded her horizon, and devoted time to culture connections. Her time at Cornell, where she not only yielded life-long friendships and mentorships but also embraced her transition to young adulthood, will be memorable.

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Lastly and most importantly, I express my gratitude to all participants, including local berry growers, buyers, distributors, consumers, and retailers. Their direct input provided many of the first-hand information and shaped the final deliverables of this project. This study would not have been completed without the support from many.

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INTRODUCTION

The berry industry is an important part of New York State's (NYS) agri-food economy. As of 2017, the statewide production value of berries was over $9.7 million (NASS, 2017 NY Agriculture Overview 2017). To illustrate the importance of the NYS berry sector, the production volume for strawberry and blueberry ranked 6th and 10th nationwide, respectively (NASS, 2016 - 2017 Agricultural Statistics Annual Bulletin for New York 2017). According to the New York State Berry Grower's Association, there are close to 400 farms that sell berries, primarily strawberry, blueberry and raspberry, through several channels including wholesale, retail, farmers' markets, and pick-your-own (U-pick) operations.

Although the nationwide berry consumption has increased over the past years, the berry production in New York State have actually declined. On the one hand, the demand for berry doubled, grew from 5.31 pounds per capita in 2000 to 10.25 pounds in 2015 (ERS 2018). On the other hand, blueberry production in New York have dropped from 1.8 million pounds in 2014 to 1.4 million pounds in 2016. Similarly, strawberry production shrank from its peak 1,400 acres in 2012 to 800 acres in 2016 (NASS, 2016 - 2017 Agricultural Statistics Annual Bulletin for

New York 2017). The berry industry in NYS is simultaneously facing attractive market opportunities and formidable challenges.

The objective of this study is to conduct a SWOT analysis that enable us to examine the barriers to the development of the berry industry in NYS and to identify opportunities for the future. New York State, as an important food distribution hub for northeast region, has many natural advantages and the capability to support a stronger local berry market. As part of the research, detailed quantitative production data was collected through secondary resources such as the USDA and NYS's agriculture extension office. We validated enterprise budgets for strawberries, blueberries, and raspberries that were conducted a few years back by Cornell extension. Validation was done through in person interviews and phone interviews with the involved parties, including numerous berry growers from NYSBGA association, buyers and wholesalers from regional markets and stores. Particularly, for the NYS production and marketing cost baseline tool, a survey was distributed to all members in NYSBGA organization. Through the interviews and surveys, we were able to understand the strength and weakness from people who work day in and day out in this sector. Here in this paper, we assessed how NYS berry growers can compete effectively, summarized findings from all the previous work and extended ideas to give future suggestions.

SWOT ANALYSIS

A SWOT (Strengths, Weaknesses, Opportunities, and Threats) Analysis on New York berry industry was performed to further combine information and understand the industry's future. The analysis provided a direct framework to examine key factors both internally and externally that affect industry performances. The main elements of the SWOT analysis are presented in Figure 1.

Figure 1: SWOT analysis of the NYS berry industry

Strengths

Several factors give New York State comparative advantage in terms of agricultural development, including the strong industry support, great local market systems, potential for market access, unique educational resources and diversified

natural resources. Some of these strengths are obvious, such as access to a large consumer access, based on the fact that New York State's population is more than 19 million; others might be less mentioned, such as the infrastructure and the educational resources. A deep understanding of the current resources and advantages could help for better performance.

New York State is famous for its agricultural industry, especially for signature commodities – dairy products, apples, and the wine. In 2014, a total amount of $44.8 billion and 145.3 thousand jobs were directly contributed by agricultural production, manufacturing and supporting services (T. M. Schmit 2016). The large economic footprint ensured a statewide cohesive system, which included appropriate market infrastructure, distribution channels, agricultural services, and transportation infrastructure that can connect production with the market. Besides the success of the system, huge consumer demand also plays an important role. As of 2016, New York City has an estimated population of 8.5 million, which is nearly half of the state population. The metropolitan area is a well-established market with large demand for fresh produce. New York farmers have various ways to accesses the most populated region of the country and can easily differentiate their products in the local market. Geographic diversity is another strength of the development potential of the berry industry. The wide range

of geographic and micro-climatic conditions allows an extended berry production season.

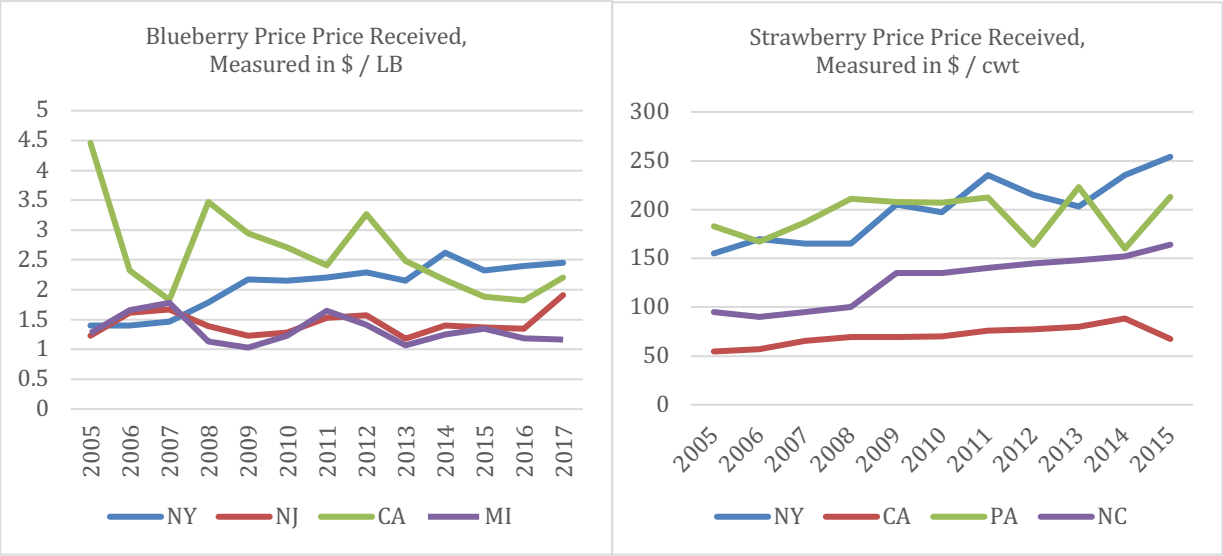
Weaknesses

Key weaknesses are identified in the following categories: weather constraints, technology transformation and adoption, production cost efficiency, scale effect, and spread out farm locations. Many of these factors faced by the berry industry are systematic and have historical roots, such as the average scale of farms and statewide sprawled farming regions. It can be a disadvantage for farmers to enter either wholesale or direct market, if they have a small operation scale or they are physically far away from urban areas. Other noticeable weaknesses should receive more attention and be tackled as the priorities, especially technology adoption and transformation. The ever-increasing pressures of the changing market conditions and farming environments are demanding faster reactions and transformations happening in the berry sector. Inevitably, the pest outbreaks and weed control issues increased the pesticide application and other chemical inputs. In many cases, consumers are directly requesting for more sustainable practices and less environmental impacts. Adopting agricultural technologies and transforming to new practices could be the answers to those requests. A recent paper published by researchers from North Carolina State University also discussed the impact of technology investment on the profitability of blueberry

production (Safley, Cline and Mainland 2012). In New York State, low investments in technology, slow improvements on current practices, and low adoption of mechanization are the weaknesses that should be addressed first.

Production costs are most likely to vary from one farm to another due to diverse market conditions, labor supply, equipment availability, and farms managerial decisions among NYS berry growers. Price thus becomes an important indicator to evaluate the cost-effectiveness of the system. In a competitive market, higher production cost drives up the price and higher price make the products less competitive relative to other states. Figure 2 shows that New York berry price has hiked comparing with prices in other berry-producing states (ERS 2018). The relatively high production cost in NYS reflected in the high market price, making it less favorable for entering wholesale and other intermediated distribution channels.

Figure 2: Blueberry and Strawberry Price Received



Opportunities

Future industry growth relies on utilizing existing resources, including research innovation, technology dissemination, market access, infrastructure, state regulation, and etc. Viable ways to utilize effectively these resources require higher levels of cooperation, collaboration and coordination, in order to ensure a win-win relationship across the supply chain. Key areas of future opportunities identified include:

a. Strengthening technology capacity through cooperation

Cooperation with research institutes, state agencies, farmer organizations and extension offices are crucial for a sustained agricultural system in many ways. There have been numerous notable achievements in recent years which should be scaled up. After the invasive pest outbreak and substantial lost, New York Berry News released an issue about using Exclusion Netting practices to Combat SWD in 2017. This was a successful coping mechanism to control for SWD. In addition, a new strawberry variety, Archer, was bred for commercial production and it is well adapted to local conditions. High tunnels for growing raspberry were promoted based on the work of a group of researchers at Cornell University to extend the production season. Such technologies cannot move from the research lab to field production without a smooth cooperation.

In New York State, the Cornell Cooperative Extension (CCE) is the key organization dedicated to helping growers with production. A close connection with CCE will ensure proper technology dissemination to address urging issues, such as integrated pest management (IPM), precision agriculture, and controlled environments practices, among others. When facing challenges such as severe weather and changing market demand, the faster to adopt new practices and technology, the better adaptation to the market will be.

The high-value of berries also drives innovation, making it a target for new technology applications, such as automation, proprietary, and potential genetic modification. The opportunities are presented that NYS could further embrace and support research efforts to form an active tech hub, where resources and industry knowledge are shared publicly, and fieldwork experiments are conducted supporting advanced theories. Ideally, the agricultural technology hub could strengthen both the statewide research power and the cooperation and communication with the Agri-tech community within the world. Currently, NYS major agricultural research institutes are Cornell University's College of Agriculture and Life Science and New York State Agricultural Experiment Station (NYSAES) in Geneva. A designated tech center could be formed to combine current resources and lead the technology moving forward.

b. Greater market opportunities through collaboration and coordination.

Collaboration among growers and industry stakeholders will further extend market opportunities. About 95% of berry production is for the fresh market, which includes farmers markets, retails, U-pick, restaurants and wholesale (Harrington and Good 2000). Selling fresh locally should be the primary goal for small growers in order to get premium prices. In addition, different channels within the fresh market should be carefully examined, considering factors like production capacity and branding. For example, the booming bakery and restaurant businesses in recent years created this boutique high-value market that may be attractive to berry growers. Relationship building and collaboration with the local business community often result in higher profits.

Coordination in the form of share groups, farm co-ops, or grower alliances is a great way to generate economies of scale. A significant barrier for berry growers who want to enter wholesale intermediated is the small production scale. As a readily available solution, growers could collaborate to increase volumes required by buyers and a greater bargain power, especially for those in the key production regions. Frequently used by many successful businesses, forming a stronger association or co-op is the key to centralize business functions and lowering shared risk. Thus, the individual farm could focus more on production efficiency and have a bigger market opportunity.

There is another untapped marketing channel, namely processed food, which is a broader market channel related to manufacturer ranging from juices, preserves, frozen, wines to snacks. Research focusing on NYS food manufacturers showed that upstate New York purchased on average 71% of their input supplies from firms in the region, while downstate had as low as 52% (Schmit, et al. 2012). The recent trend of sourcing locally is also suggesting that "local" brings higher consumer's brand recognition. Berry growers might find a tremendous market by linking with processing plants and adding value to less aesthetic fruits or crop surpluses. Especially under labor shortages, processing berries can help preserve highly perishable fruits and allow more flexible production and harvest schedules. If the berry industry could collaborate with New York's signature dairy, apple and wine industries, they will have a considerable advantage for expanding and entering the value-added sector. Since NYS has a very well established agricultural supporting system, collaboration will enable sharing resources across different platforms like transportation, workforce, consumer base, marketing and branding to achieve greater market success and booth state economy.

c. A stronger outreach and promotion

Despite efforts from individual farms, the governance of the industry will also shape the future of berry markets. In New York State, the current lead organization is the New York State Berry Growers Association (NYSBGA).

Founded in 1988, the organization strives for promoting industry growth, helping funding researches, and representing growers for legislating rights (NYSBGA). It is hard to estimate the true value of an organization if only focusing on short turn monetary return measures. But when walking around trade shows for fresh produce, it's easy to find the value of advertising and networking for new opportunities. The aggressive approach for outreaching should lead by a strong organization to further enforce the New York local branding and foster connections.

NYSBGA could also take more initiatives on consumer campaigns and public education about local berries. While most farmers deal with distributors and wholesalers, few could have a direct connection with urban consumers. Raise awareness and recognition of local berries will increase consumption over the time, especially when with the target market consists of school kids and young adults. In return, consumer demand and the active engagement will also push the distributors and buyers to source more local berries. The overall awareness of the local berry industry might bring a positive impact on the workforce availability as well, attracting more skilled workers. Overall, a strong association among berry growers opens up market opportunities by facilitating in-state cross-industry collaboration, better cooperation with researchers and building direct relationships with consumers.

d. Unique branding and market penetration

Whether it is using labels like “Agri-tourism”, “U-pick experience”, “Local”, “Flavor”, “Sustainable” or “Organic”, a unique branding will help NYS berry growers differentiate their products and succeed in an increasingly competitive market. While the Northeast region has a short production season for berries, the demand for berries is year-round, creating opportunities for large farms able to grow berries in different geographies. It is crucial to establish a local consumer base by offering a tailored value proposition. We are seeing an emerging trend that consumer groups are more segmented than ever. People shop based on distinctively different social values and needs, creating more refined market opportunities. There are several marketing strategies for NYS berry growers to take on: targeting a few consumer groups to spread word-of-mouth campaign, whether it’s gym gurus, vegan lifestyle adopters or stay-at-home moms; promoting through local communities’ events that match with your proposition; working with restaurants and chefs that are focusing on local sourcing. Knowing the right strategy to differentiate and communicate with targeted consumers will then enter less crowded boutique markets and increase the overall market share.

Ultimately, there are various ways to add values to NYS produce in general, and berries in particular. First, extending seasonality of local berries could be a big selling point for growers. Early and late availability could be achieved by using

high tunnels or blending different mature stage varieties. Since the market price fluctuates based on supply volume, the early season crop will get a premium price and higher market demands. Second, conventional berry growers could transit into different farming practices. Apparently, organic and local-produce are the most well-known attributes associated with berry when it comes to consumers making buying decisions. Unlike large-scale mechanic-operated production, small farms often need to highlight their practices principles with a human touch. Whether it is focusing on organic, sustainability or IPM practices, the farming practice is a reiterate of people's connection with nature and then attract a specific segment of consumers. At the same time, focusing on improving the quality of the fruit will ensure that high price level can be maintained, especially for the farmers market and other high-end channels. Third, growers are tasked with adding value beyond single product and service. During the market channel survey, many farms indicated that they have Pick-u-own operation. The local traffic for u-pick during the season is critical but have always been complicated by the constraint of publicity and geographic location of the farms. With some improvements, such as diversifying crops and upgrading tourist facilities farms will be able to enhance the consumer experience and benefit from agri-tourism resources. In conclusion, with a unique branding and proposition, berry growers should be able extend their market presence and increase berry market share.

Threats

Labor shortages, environmental stresses, and pest outbreaks are continuing to be the major threats for the industry. Berry growers are not alone dealing with those issues. For labor shortages, the tightening labor market nationwide and the current immigration policy both lead to greater constraints for agricultural development. There are some ideas coming from farmers on how to cope with the situation: incorporating technology and transforming their operations to be less labor-intensive, adjusting the price to reflect the higher cost of attracting labor, and maximizing local resources by recruiting among the NYS's growing Amish communities or hiring more high schoolers. After all, the competition for human resources is extensive and will drive transformation in all industries.

Multidimensional efforts are also required at the institutional level to attract workers. A stronger governance of the association will better represent the industry and draw public attention, therefore providing a positive interaction with young talent and specialists. A more detailed strategy will be discussed later regarding future opportunities for berry industry.

Climate change and its severe environmental impacts, as well as the ever-increasing difficulty of controlling pests, are put enormous pressure on berry growers, especially for those producing organic crops. Extreme weather patterns usually interfere with production schedules and often cause lower yields. There

were reports across the state in 2017 about the substantial amount of rainfall, during which berry growers suffered a huge yield loss. Environmental threats such as the abnormal weather were only a part of the whole picture. According to Cornell Fruit Resources, the berry value damage cost by Spotted Wing Drosophila (SWD), an invasive fruit pest first spotted at 2011 in NYS, reached approximately $4.3 million in revenue, with an average of 80% losses in raspberry and 30% losses in blueberry crops lost due to infestation (Economic and Environmental Impact of SWD 2012). The battle towards these increasing environmental and biological threats will require additional efforts and carefully crafted strategies. The question boils down to whether farmers are acting fast enough to get helpful resources and adjust their practices to mitigate climate change.

External threats, such as climate and policy changes, with the right solving approach are still not detrimental to the local economy compared with the internal factors. One takeaway from our market channel survey of growers is that 70% percent of them indicated no intention to expand production, due to discouraging circumstances such as labor shortages, retirement plans, lack of selling channels and increasing operation cost. As a result, New York State strawberry production acres dropped from 1600 acres at 2012 to 900 acres at 2016 (NASS, 2016 - 2017 Agricultural Statistics Annual Bulletin for New York 2017). The low motivation to

expanding berry businesses could be slowing statewide berry production growth more than ever.

Conclusion

By identifying the berry industry's strengths and weakness first, we were able to map out the competitive advantage of the industry and to identify key elements of strategic priorities. Maximizing research capacity and leveraging on other agricultural industries were highlighted as key strengths. Key weak points like lack of adoption of new technologies need to be addressed with urgency. As the challenges of labor shortages, climate change, and pest outbreaks keep rising, it's crucial to reach a consensus across industry actors and to develop alliances throughout the berry industry. The key principles for the strategy underscore that the industry needs to take advantage of underutilized marketing channels and resources, emphasizing profitability and developing coping mechanisms to face climate change. The analysis also shows that opportunities and challenges for the industry go hands in hand. The top threats identified by the study included labor availability, and environmental threats. By maximizing strengths and mitigating threats, new opportunities were identified, including the need to take advantage of NYS's technological capacity, the diverse market access opportunities, the possibilities for local branding development, and the need for coordination and collaboration for outreach and marketing initiatives. Having a comprehensive

understanding of the current market situation for the NYS berry industry is merely a beginning point. Additional effort are certainly required to boost the NYS berry industry's development based on the opportunities identified in this study.

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